UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,647	02/10/2004	Stephen F. Badylak	3220-74581	1287

7590 05/18/2007

Barnes & Thornburg
11 South Meridian Street
Indianapolis, IN 46204

EXAMINER	
AFREMOVA, VERA	
ART UNIT	**PAPER NUMBER**
1657	
MAIL DATE	**DELIVERY MODE**
05/18/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/775,647	BADYLAK ET AL.	
	Examiner	Art Unit	
	Vera Afremova	1657	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _____.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 4-15 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 4-15 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claims 4-15 as amended (3/06/2007) are pending and under examination.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 4-15 as amended remain rejected under 35 U.S.C. 103(a) as being unpatentable over WO 96/24661 and/or US 5,695,998 (Badylak et al.) taken with Gottrup et al., US 5,759,830 (Vacanti et al.) and US 4,829,000 (Kleinman et al.) as explained in the prior office action and repeated herein.

Claims are directed to a method for culturing eukaryotic cells *in vitro* on a substrate comprising stomach submucosal tissue under conditions conductive for proliferation of the cells. Some claims are further drawn to the use of stomach submucosal tissue as coating for cultureware, to the use of stomach submucosal tissue in fluidized form or in powder form.

WO 96/24661 and/or US 5,695,998 (Badylak et al.) disclose a method of culturing eukaryotic cells *in vitro* in a culture medium comprising submucosal tissue under conditions conductive for proliferation of the cells. For example: see WO 96/24661 entire document including page 5 and/or table 2. For example: see US 5,695,998 entire document including table 2. The submucosal tissue is used as a coating for cultureware to provide for cell support, for cell attachment, proliferation and differentiation (US 5,695,998 at col. 4, line 13). The submucosal tissue is used in fluidized form or in powder form (US 5,695,998 at col. 5, lines 60-61). In

particular embodiments of the cited WO 96/24661 and/or US 5,695,998 the submucosal tissue is derived from intestines.

The cited WO 96/24661 and/or US 5,695,998 also teach that the submucosal tissue-derived matrices are mostly collagenous matrices. In particular embodiment of the cited WO 96/24661 and/or US 5,695,998 teach the use of intestinal submucosa as collagenous matrices for culturing cells. However, the stomach tissues also contain collagen as evidenced by Gottrup, for example: see abstract. The collagen-coated matrices have been known and used for culturing various eukaryotic cells, for example: see US 5,759,830 entire document including table IV and col.10, lines 45-50. The complex ECM derived from animal tissues have been known and used for culturing various eukaryotic cells, for example: see US 4,829,000 entire document including abstract.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the claimed invention was made to substitute stomach submucosa for intestinal submucosa in the method for culturing eukaryotic cells in the presence of submucosa tissue-derived matrices with a reasonable expectation of success in cell support, attachment, proliferation and differentiation because both stomach submucosa and intestinal submucosa contain collagen and because various collagenous matrices including sole collagen and/or complex collagenous matrices have been known and used for cell cultures as adequately demonstrated by US 5,759,830 and by US 4,829,000. Thus, the use of stomach submucosa-derived matrix is an obvious variant of the intestinal submucosa-derived matrix for cell support, attachment, proliferation and differentiation. Thus, the claimed invention as a whole was clearly *prima facie* obvious, especially in the absence of evidence to the contrary.

The claimed subject matter fails to patentably distinguish over the state art as represented be the cited references. Therefore, the claims are properly rejected under 35 USC § 103.

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 4-15 remain rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim(s) 1 of U.S. Patent No. 5,695,998.

Although the conflicting claims are not identical, they are not patentably distinct from each other because both are directed to methods of culturing eukaryotic cells in the presence of a culture growth substrate comprising submucosa tissue-derived collagenous matrices. The scope of the pending claims is drawn to culturing eukaryotic cells and, thus, it is broader than the scope of the issued claim(s) that is drawn to culturing one particular type of cells such as islets cells. With respect to the claimed submucosal tissue the scope of the issued claims is broader than the

scope of the pending claims since the issued claim(s) are drawn to the use of a generic submucosal tissue as claimed while the pending claims are drawn to a particular submucosal tissue such as stomach submucosa.

Accordingly, the claimed methods in the patent US 5,695,998 and in the present application are obvious variants. Therefore, the inventions as claimed are co-extensive.

Response to Arguments

Applicant's arguments filed 3/06/2007 have been fully considered but they are not persuasive.

1. With regard to the claim rejection under 35 U.S.C. 103(a) as being unpatentable over WO 96/24661 and/or US 5,695,998 (Badylak et al.) taken with Gottrup et al., US 5,759,830 (Vacanti et al.) and US 4,829,000 (Kleinman et al.) Applicants argue that none of the references, alone or in combination, describes the use of a matrix that contains only collagen and none of the references, alone or in combination indicates that collagen is the factor in the matrix composition that promotes cell grow in the manner that it would have been obvious to substitute stomach-derived submucosa for intestine-derived submucosa (response pages 7-8). This argument is not found particularly convincing because collagen is a main component in the complex substrates such as submucosal layer of the stomach and intestine which is not differ from each other as evidenced by Gottrup (abstract and paragraph bridging page 222 and 223). The cited references teach the use of collagen alone or in complex substrates for culturing various eukaryotic cells, for example: see US 5,759,830 entire document including table IV and col. 10, lines 45-50. Thus, the use of a stomach collagenous submucosa-derived matrix is an obvious variant of an intestinal

collagenous submucosa-derived matrix as substrate for cell support, attachment, proliferation and differentiation.

Applicants appear to argue that the prior art teaches that collagen and/or complex ECM matrix is a factor for cell attachment but not a factor for cell growth. Yet, pending claims are not limited to the use of submucosa as a sole condition for cell proliferation by the virtue of open language "comprising". Moreover, the claimed invention is drawn to incorporation of cell culture media, for example: see claims 8 and 14.

The claimed subject matter fails to patentably distinguish over the state art as represented be the cited references. Therefore, the claims are properly rejected under 35 USC § 103.

2. With regard to the claim rejection on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claim(s) of U.S. Patent No. 5,695,998 applicants argue that the instant claim are directed to the use of a new submucosa tissue such as "stomach" submucosa. Yet, the issued claims are broader and they drawn to the use of a generic submucosa.

No claims are allowed.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL.** See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO

MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vera Afremova whose telephone number is (571) 272-0914. The examiner can normally be reached from Monday to Friday from 9.30 am to 6.00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jon P. Weber, can be reached at (571) 272-0925.

The fax phone number for the TC 1600 where this application or proceeding is assigned is (571) 273-8300.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Technology center 1600, telephone number is (571) 272-1600.

Vera Afremova

AU 1657

May 15, 2007

VERA AFREMOVA

PRIMARY EXAMINER